

# HABITAT CHANGE & RESTORATION

## NATIVE SHELLFISH RECOVERY

### PROJECT AT A GLANCE

#### Title

A Collaborative Approach to Address Larval Supplies and Settlement during Restoration of Native Olympia Oysters

#### Place

Coos Bay, Oregon

#### Reserve

South Slough NERR

#### Intended Users

Oregon Department of Fish and Wildlife, Shellfish Program  
NOAA National Marine Fisheries Service, Community-based Restoration Program

#### Project Team Partners

South Slough NERR, University of Oregon, Oregon Sea Grant Extension, Oregon State University Extension

#### Timeline

9/2010 to 9/2013

#### Learn more:

##### Steve Rumrill

Principal investigator & research coordinator, South Slough NERR  
[steve.rumrill@state.or.us](mailto:steve.rumrill@state.or.us), 541-888-2581, ext 302

##### John Bragg

Outreach lead & coastal training program coordinator, South Slough NERR  
[john.bragg@state.or.us](mailto:john.bragg@state.or.us), 541-888-5558 ext 29

## Bringing the Olympia Oyster Home

Pint-sized with razor sharp edges, the Olympia oyster (*Ostrea lurida*) once flourished in several estuaries along Oregon's rugged coast. Millions of oysters formed extensive beds that blanketed the intertidal and subtidal zones of places like Coos Bay and Yaquina Bay, where they provided food and income for people, and habitat for a rich assortment of wildlife. Today, over-harvesting, development, sedimentation, pollution, dredging, and forest fires have played a role in the dramatic decline of this native shellfish that, in many places, has become locally extinct.

Bringing the "Oly" back to Oregon's coastal waters has become a priority for natural resource managers, scientists, shellfish farmers, and recreationists. A team led by the South Slough National Estuarine Research Reserve (NERR) is conducting the science and forming the relationships necessary to make Coos Bay the epicenter of the state's restoration efforts. Their goal is to advance local understanding of the oyster's reproductive biology and early life history and work with a diverse group of stakeholders to weave that science into a plan to restore self-sustaining populations of oysters back to the estuary.

### Local Context

The next time you order up a plate of Pacific oysters, there is a high probability that it came from Coos Bay. An oyster-farming powerhouse, the Bay is home to four commercial growers that cultivate about 1,500 acres of non-native Pacific oysters, worth about \$10 million each year. Coos Bay is also Oregon's largest maritime industrial center, and a deep navigational channel cuts through its drowned river-mouth



*Setting oyster pyramids for the South Slough Olympia oyster recovery effort.*

basin to connect local commerce to shipping ports from Long Beach to Tacoma and out to the Pacific Rim. Its tides sweep over an area roughly the size of Bermuda. At low tide, broad expanses of sand and mud flats are exposed along a shoreline that has been highly modified by diking, dredging, and addition of rocky rip-rap.

The South Slough NERR is nestled in a relatively pristine subbasin that is hydrodynamically connected to the rest of this largely industrialized estuary. Though fed by distinct watersheds, the waters of the Slough are subject to the impacts of land use in other parts of Coos Bay, making it an excellent natural laboratory to address questions of concern to the larger estuary.

Native oyster restoration is a Reserve research priority. Three years ago, the staff received a federal start-up grant for a pilot restoration project. Since then they have re-introduced about 4,000,000 juvenile oysters to the Slough. In the process, they developed strong working relationships with the local commercial shellfish growers who have common interests in the ecosystem services provided by shellfish beds, recovery efforts that enhance estuarine water



NATIONAL ESTUARINE  
RESEARCH RESERVE SYSTEM  
SCIENCE COLLABORATIVE



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## SUPPORT FOR THIS PROJECT

This project was funded by the NERRS Science Collaborative.

The Science Collaborative uses a competitive process to identify and fund science to address environmental challenges in communities served by Reserves. Projects are selected through annual competitions, designed to insure that investigators, intended users of the science, and relevant stakeholders work together to describe science needs to address specific problems, define research questions, design and implement projects, and apply the results.

The program works with outreach specialists, trainers, and communicators to share information about the science that it funds with other Reserves and the broader coastal management community.

The Science Collaborative also sponsors Training for the Integration of Decision-Making and Ecosystem Science (TIDES), a UNH-based program that helps develop the skills needed to link science-based information to coastal resource management decisions. TIDES offers a non-thesis master's degree track and is developing a professional certification program.

The NERRS Science Collaborative is administered by the University of New Hampshire (UNH) through a cooperative agreement with the National Oceanic and Atmospheric Administration (NOAA).

For more information,  
please contact:

Dolores Leonard  
603-862-3685  
dolores.leonard@unh.edu



*"You can't be afraid of revisiting the old science related to shellfish restoration," says the project's principle investigator, Steve Rumrill. "You need to be prepared to embrace what is locally relevant and to generate new information to fill the gaps."*

quality, and prevention of poaching.

## Project Goal

This project aims to build on existing research and relationships to establish a community stakeholder group committed to working collaboratively to bring the Olympia oyster back to Coos Bay. The project team will work with this group to develop a comprehensive restoration

and management plan for Coos Bay, one that is

based on enhanced scientific understanding of the oyster's early life history and focused on the development of a self-sustaining population of multi-generational oyster beds. Ultimately, they hope to create best practices for oyster research

## APPROACH

### Collaborative

This project's success depends on a wide group of stakeholders who can provide expert knowledge, practical experience, access to local data, critical input on key decisions, and ultimately, will benefit from the project's results. This fall, the project team will convene the Olympia Oyster Recovery Advisory Committee, a group that will include representatives of state and federal natural resource agencies, universities, commercial shellfish operations, port and harbor districts, oyster restoration practitioners, local tribes of indigenous peoples, and public stakeholders.

The project's "integration lead" will use Structured Decision Making to help project investigators and the Committee work together to achieve the following:

- A shared vision for Olympia oyster recovery and mutual understanding of the challenges that must be overcome to achieve that vision;
- A conceptual model that integrates scientific, social, and economic influences on Olympia oyster recovery that can be used as a decision making tool throughout the project and beyond;
- Specific management objectives to guide the recovery effort and ways to measure its success;
- Alternative management actions that could change shoreline activity that impacts oyster populations and evaluation.

### Biological Science

Like politics, the science behind oyster restoration is local. A general understanding of how the shellfish lives and breeds must be examined in the context of the environmental conditions of the site where the recovery is planned. This team will dig into the life of Olympia oysters in the highly dynamic and modified environment of modern Coos Bay. Their investigation will have three components:

- **Reproduction:** Through field surveys and laboratory studies, the project will address key questions about the Olympia oyster's breeding population, its reproductive cycle, and the timing and size of its brood release in Coos Bay.
- **Larval supplies & distribution:** Researchers will combine monitoring of physical conditions with zooplankton sampling, modeling, and tracking studies to characterize how oyster larvae are distributed in time and space in Coos Bay.
- **Larval settlement & metamorphosis:** This component will look at how oyster larvae settle and mature within the tidal waters of Coos Bay. It will explore the role of different substrates, tides, variability in food sources in this process, and whether settlement on other oyster species impacts the overall productiveness of the Olympia oyster.